W5YI

America's Oldest Ham Radio Newsletter

REPORT

Up to the minute news from the world of amateur radio, personal computing and emerging electronics. While no guarantee is made, information is from sources we believe to be reliable.

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In This Issue...

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Preparations for WRC-2003 Shift into High Gear

"In today's fast-moving environment, membership of the International Telecommunication Union gives governments and private organizations a unique opportunity to make an important and valued contribution to the developments rapidly reshaping the world around us. ITU membership represents a cross-section of the telecommunications and information technology industry, from the world's largest manufacturers and carriers to small, innovative new players working in new fields like IP networking. Founded on the principle of international cooperation between government and the private sector, the ITU represents a global forum through which government and industry can work towards consensus on a wide range of issues affecting the future direction of this increasingly vital industry."

Samuel Morse sent his first message over a telegraph wireline between Washington and Baltimore in 1844. Ten years later, telegraphed communications became the rage. In an instant, it covered distances that took stagecoaches, pony express riders or locomotives days ...or even weeks to span.

But there were problems. Telegraph lines did not cross national frontiers. Each country used a different system and each had its own telegraph code to safeguard the secrecy of its military and political communications. That meant messages had to be transcribed, translated and physically handed over at national frontiers before being retransmitted over the telegraph network of the neighboring country.

So it is not surprising that, in 1865, twenty European countries entered into an agreement to interconnect their national networks. They decided on common rules to standardize equipment, adopted uniform operating instructions and laid down common international tariff and accounting rules.

The first radio frequency allocations were made in 1927 to the five radio services existing at the time. They were the fixed, maritime and aeronautical mobile, broadcasting, amateur and experimental radio services.

The International Telegraph Union established in Paris on May 17, 1865 and the International Radiotelegraph Union established in Berlin in 1906 merged into the International Telecommunication Union (ITU) in Madrid in 1932. In 1947 the ITU became a specialized United Nations agency and its headquarters was moved to Geneva, Switzerland.

Today, more than 135 years later, the reasons which led to the establishment of.the ITU still apply and the fundamental objectives of the organization remain basically unchanged. In a sentence, the ITU is a worldwide organization which brings together governments and industry to coordinate the establishment and operation of global telecommunication networks and services.

Membership of ITU is open to governments, which may join the Union as Member States, as well as to private organizations like carriers, equipment manufacturers, funding bodies, research and development organizations and international and regional telecommunication organizations, which can join ITU as Sector Members.

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At present, ITU membership includes 189 different countries and over 650 "Sector Members." All United Nations countries are automatically members of the ITU. And those that are not UN members can be voted in by two-thirds vote.

ITU Member States and Sector Members have access to a number of services including the online Telecommunication Information Exchange Service. TIES makes all ITU activities, documents and statistics readily available to everyone over the World Wide Web.

In 1993, the ITU was remodeled into three sectors. They are the Telecom Standardization Bureau (commonly referred to as ITU-T), the Telecom Development Bureau (ITU-D), and the Radiocommunications Bureau (ITU-R).

The ITU-T mission is to ensure an efficient and on-time production of high quality standards covering all fields of telecommunications except radio aspects. At present, more than 2600 Recommendations (Standards) encompassing some 60,000 pages are in force. The purpose of the Telecommunication Development Sector (ITU-D) is to promote the advancement in telecommunications worldwide.

According to the ITU, the objective of the Radiocommunication Sector is "...to ensure rational, equitable, efficient and economical use of the radiofrequency spectrum by all radiocommunication services, including those using satellite orbit, and to carry out studies and adopt recommendations on radiocommunication matters." The objective is achieved through periodic international telecommunications meetings called World Radio Conferences (WRC) and the approval of recommendations.

WRCs used to be called World Administrative Radio Conferences (WARC) and were held about every twenty years. But with telecommunications technology changing so fast and being so important to the global economy, they now are assembled every two or three years.

The next one, to be held in 2003, will be considering the Article S25 international regulations governing the Amateur Service ...the first "top-to-bottom" revision of the international ham radio rules in many decades. It is anticipated that Morse code proficiency as a prerequisite to HF operation will be eliminated at WRC-03.

The second important issue involves a possible realignment of the amateur and short-wave broadcasting bands around 7 MHZ on a worldwide basis. At present, there is an overlap between the two services.

WRC-03 is scheduled to be held between June 9 and July 4, 2003. Originally to be convened in Geneva, WRC-03 will probably be moved to Caracas, Venezuela since that nation has volunteered to host the meeting. The agenda for this conference was approved at WRC-2000 in Istanbul, Turkey.

Advisory and Study Groups

Each of the three ITU bureaus has various Advisory and Study Groups. The most recent ITU Advisory Group meeting impacting Amateur Radio was held in Geneva in mid-March of this year. The purpose of the meeting was to establish a new Informal Group in preparation for WRC 2003, to seek information on various Regional preparations and to develop an agenda. All discussions are informal and participants speak in an individual capacity ...not on behalf of their country or organization.

Regional WRC-2003 preparations are also under way by APT (Asia-Pacific Telecommunity), CITEL (Inter-American Telecommunication Commission), CEPT (European Conference of Postal and Telecommunication Administrations), and ERO (the European Radiocommunications Office). There is also an Arab Group which has not yet begun operation.

The U.S. is a member of CITEL ...an affiliate of the *Organization of American States,* OAS. They have meetings scheduled for June 11-15, 2001, in Ottawa (Canada), and September 17-21, 2001, in Guatemala just before the IARU Region 2 conference.

The Study Groups represent a major aspect of ITU-R activities. More than 1 500 specialists from telecommunication organizations and administrations around the world participate in the work of the Radiocommunication Sector's eight study groups.

ITU-R Study Group 8 (SG8) covers "Systems and Networks for the Mobile, Radiodetermination, Amateur and related Satellite Services." SG 8 Chairman is C. Van. Diepenbeek of the Netherlands. (T. Mizuike of Japan, V.A. Strelets of the Russian Federation and R. L. Swanson of the United States are Vice-Chairmen.)

Each Study Group is further separated into subsidiary "Working Parties" (WP), "Task Groups" (TG) and "Rapporteur Groups" (RG.) Each addresses a particular topic item. All WRC preparatory work is to be completed by May 31, 2002.

The recommendations of each Study Group is then summarized into a CPM (Conference Preparatory Meeting) Report and circulated to the various ITU members. It will be hundreds of pages long! Follow WRC-03 progress at: <http://www.itu.int/brconf/wrc-2003/index.html>.

ITU-R Working Party 8A

...is considering specific Amateur Radio issues. The International Amateur Radio Union (IARU) has developed a document entitled "Minimum qualifications of radio amateurs, ITU-R M. [RAM. QUAL]" which has been introduced into Working Party 8A with the objective of having the various administrations of the world accept it.

These new Amateur Radio qualifications are proposed to be "mentioned" in the ITU regulations but published in another volume, a so-called *"Incorporation by Reference"* strategy. The theory is that it is easier to

change future qualifications if they lie outside of the international radio regulations. Follows is the latest revision of the "IARU – WP 8A" proposed Amateur Radio operator qualifications.

ITU-R\SG-R\SG08\WP8A – PDNR M-[RAM.QUAL]

PRELIMINARY DRAFT NEW RECOMMENDATION

The ITU Radiocommunication Assembly,

considering

a) that No. S1.56 of the Radio Regulations (RR) defines the amateur service as: A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest;

b) that No. S1.57 (RR) defines the amateur-satellite service as: A radiocommunication service using space stations on earth satellites for the same purpose as those of the amateur service;

c) that certain minimum operator operational and technical qualifications are necessary for proper operation of an amateur or amateur-satellite station,

recommends

1 that administrations should take such measures as they judge necessary to verify the operational and technical qualifications of any person wishing to operate an amateur station;

2 that any person seeking a licence to operate an amateur station should demonstrate theoretical knowledge of:

-- **Radio regulations**

• international

• domestic

-- **Methods of communications**

• radiotelephony

• radiotelegraphy

• data and image

-- **Radio system theory**

• transmitters

• receivers

• antennas and propagation

• measurements

-- **Radio emission safety**

-- **Electromagnetic compatibility**

-- **Avoidance and resolution of radio frequency interference**

Here is what CITEL has published to their North, Central and South American members regarding the Amateur Radio agenda items.

"The International Amateur Radio Union (IARU) has conducted an in-depth review of Article S25 and their position takes into account the wishes of all amateurs around the world as expressed by their national societies. ITU-R Working Party 8A is considering a proposed Preliminary Draft New Recommendation submitted by the IARU on Amateur Service and Amateur Satellite Service Operator Qualifications which could replace some of the regulatory text currently contained in S25. Consideration will need to be given to the position developed by the IARU to ensure it conveys CITEL interests. Article S19 with respect to the formation of amateur call signs will require review and possibly revision in order to increase flexibility for assignment by administrations."

Informal Working Group 6

The FCC's International Bureau has also formed various advisory committees (called Informal Working Groups or IWG) that will be assisting the Commission and the Department of State on all agenda items being considered at WRC-2003.

Amateur Radio matters are being handled by IWG-6 which has already had several meetings at FCC headquarters in southwest Washington, DC. The Vice Chairman of this committee is ARRL's Walt Ireland, WB7CSL.

The objective of these meetings is to develop a Preliminary View (or PV) on each issue. You can follow the activity of IWG-6 by connecting to the FCC's WRC-03 website at: <http://www.fcc.gov/wrc-03/welcome.html>. The United States delegation to WRC-2003 will take the recommendations of their advisory groups into consideration when arriving at a final U.S. position. You can also find a copy of the WRC-2003 agenda posted to this website.

AMATEUR RADIO STATION CALL SIGNS

...sequentially issued as of the first of June 2001

Radio District	Group A Extra	Group B Advanced	Group C Tech/Gen.	Group D Novice
0 (*)	AB0RF	KI0RY	(***)	KC0KVE
1 (*)	AA1YL	KE1LZ	(***)	KB1GWQ
2 (*)	AB2RE	KG2RN	(***)	KC2IBW
3 (*)	AA3WZ	KF3EB	(***)	KB3GQX
4 (*)	AG4JB	KV4FN	(***)	KG4NRU
5 (*)	AD5EF	KM5XL	(***)	KD5OPT
6 (*)	AD6XE	KR6ET	(***)	KG6GQV
7 (*)	AC7NM	KK7WY	(***)	KD7NJT
8 (*)	AB8KY	KI8JZ	(***)	KC8ROJ
9 (*)	AB9CD	KG9RA	(***)	KB9ZTG
N. Mariana	NH0Z	AH0BB	KH0NE	WH0ABP
Guam	(**)	AH2DO	KH2VK	WH2ANX
Hawaii	(**)	AH6RA	(***)	WH6DGN
Am. Samoa	AH8U	AH8AI	KH8DP	WH8ABF
Alaska	(**)	AL7RR	KL1DC	WL7CVH
Virgin Islands	(**)	KP2CR	NP2LS	WP2AIN
Puerto Rico	WP3L	KP3BL	WP3LA	WP4NOU

* All 1-by-2 and 2-by-1 call signs, ** 2-by-1 and *** "N-by-3" call signs have been assigned. *(Source: FCC Database)*

AUSTRALIA TO SIMPLIFY AMATEUR RADIO EXAMINATIONS

Australia's telecommunications regulator, the *Australian Communications Authority* (ACA) has issued a 35-page "discussion paper" concerning Amateur Radio operator examinations. The stated purpose of the Inquiry is to review the current ham license examination arrangements and to further minimize Australian Government involvement. Comments close on June 22.

The ACA paper discusses various alternatives while maintaining the international obligation to verify operator and technical proficiency. At present, the *Wireless Institute of Australia* (their national Amateur Radio society) provides examinations under a *Memorandum of Agreement* that expires at the end of December 2001.

When candidates have passed the required examinations, they may apply to the ACA for the appropriate *Certificate of Proficiency*. There is no Government charge for the first certificate of proficiency. The WIA charges a fee to candidates for providing examinations.

There are four levels of Amateur operator qualifications in Australia that can be gained by passing various examinations on electronics, regulations and Morse code. The particular qualifications held determines the type of Amateur license issued and privileges granted.

A very controversial portion of the paper questions whether any operator examinations and certification are necessary at all! The ACA said "It is open to debate whether a 'once only' demonstration of a person's knowledge by examination, particularly given that most Amateurs use commercially manufactured equipment, continues to serve those purposes. Could, for example, interference and operating procedures be just as well managed by license conditions and by requiring that only commercial equipment of a certain 'standard' is used?"

The ACA comment that only "type approved equipment" be used would put an end to the experimental nature of the Amateur Service in Australia. Despite its strong opposition to equipment type approval, the WIA is considering whether it might be appropriate to require commercial equipment in a limited circumstance such as for a beginners license which "...would make the hobby attractive to a large number of people and would not involve a high level of electronic equipment experimentation or construction."

New Amateur examination system

Assuming that Australian radioamateurs require testing, the ACA envisions that, under any new arrangements, examiners will be able to conduct examinations and issue certificates without prior ACA approval. "This could be achieved with independent examiners developing and maintaining the exam structure and questions. ...It is essential that examiners hold suitable qualifications and relevant experience. In common with many educational systems, it is expected that examiners would hold higher qualifications than those being examined."

As in the United States, examinations might be constructed by selecting appropriate multiple choice questions from a large common question bank. "Exams could then easily and quickly be developed on demand." The ACA said it had no objection to the banks being made available to the public. Examiners would be able to charge for providing examinations which "...may incorporate 'cost recovery' and 'profit' elements."

In summarizing its preferred position, the ACA said it favors the use of a common bank of examination papers, or a common bank of questions, rather than allowing individual examiners to write their own questions. The ACA believes that a "reference panel" should either develop the banks of papers or questions itself, or oversee the development of the banks of papers or questions by a contractor. It is expected that most examiners will choose to issue the ACA's Certificates of Proficiency. The ACA suggests that two additional "invigilators" *[a new word to us!]* be present to supervise an examination.

Consideration is also being given to making the examinations widely available over the Internet. "The increasing use and acceptance of the Internet as a means of communications and delivery of services raises questions about whether it can be used to provide examinations under the new arrangements," ACA said. "Although the Internet is a convenient means of providing candidates, especially those in remote areas, with an examination paper, the ACA is concerned about how the examiner can be sure that an examination result is solely the work of the candidate."

Summary of comments sought from the public

1. The ACA welcomes comments about whether operator certification is always necessary, and, if not, under which circumstances could the requirement be dropped?.
2. Whether there should be a common syllabus and who should be responsible for its development and maintenance.
3. What should be the on-going role of the ACA?.
4. Should examiners be permitted to write their own questions? If so, what steps are necessary to maintain examinations standards.
5. Should there be a common bank of examination papers and/or questions and whether they should be published?
6. Should the examination arrangements be over-sighted by a reference panel?
7. What is an appropriate examination fee?
8. Should examiners issue their own certificates ...or certificates on behalf of the ACA and what level of security arrangements should be employed?
9. How may examinations be administered via the Internet without jeopardizing qualification standards.
10. Which organizations should be appointed as examiners and what qualifications should Amateur operator examiners hold?
11. What should be the minimum number of invigilators (supervisors) for an examination?
12. What arrangements should be in place to prevent fraud?

EXTRA CLASS QUESTION POOL TO BE REVISED

On April 15, 2000, the Question Pool Committee (QPC) of the *National Conference of Volunteer Examiner Coordinators* (NCVEC) released new Technician, General and Extra Class Question Pools. Now the QPC is continuing their routine revision with one pool being revised each year. The Extra Class pool is the first to be revised. It will be completed by year end and the new Element 4 questions must be used in all Amateur Extra Class examinations administered on/after July 1, 2002.

On May 15, 2001, the QPC released a draft Question Pool Syllabus for the written Extra Class license exam Element 4. The QPC is now accepting suggested Element 4 questions that could be included in this pool. Each question should contain no more than 210 characters/spaces. Each of the four possible answers should contain no more than 140 characters/spaces.

Questions should be submitted to the QPC via e-mail prior to August 1, 2001. Their e-mail addresses:

- Scotty Neustadter W4WW, (Chairman, QPC) <w4ww1@home.com>,
- Bart Jahnke W9JJ, <bjahnke@arrl.org>, and
- Fred Maia W5YI, <fmaia@prodigy.net>.

SUBELEMENT E1 -- COMMISSION'S RULES [7 Exam Questions -- 7 Groups]

E1A Operating standards: frequency privileges for Extra class amateurs; emission standards; message forwarding; frequency sharing between ITU Regions; FCC modification of station license; 30-meter band sharing; stations aboard ships or aircraft; telemetry; telecommand of an amateur station; authorized telecommand transmissions; definitions of image, pulse and test

E1B Station restrictions: restrictions on station locations; restricted operation; teacher as control operator; station antenna structures; definition and operation of remote control and automatic control; control link

E1C Reciprocal operating: reciprocal operating authority; purpose of reciprocal agreement rules; alien control operator privileges; identification (Note: This includes CEPT and IARP.)

E1D Radio Amateur Civil Emergency Service (RACES): definition; purpose; station registration; station license required; control operator requirements; control operator privileges; frequencies available; limitations on use of RACES frequencies; points of communication for RACES operation; permissible communications

E1E Amateur Satellite Service: definition; purpose; station license required for space station; frequencies available; telecommand operation: definition; eligibility; telecommand station (definition); space telecommand station; special provisions; telemetry: definition; special provisions; space station: definition; eligibility; special provisions; authorized frequencies (space station); notification requirements; earth operation: definition; eligibility; authorized frequencies (Earth station)

E1F Volunteer Examiner Coordinators (VECs): definition; VEC qualifications; VEC agreement; scheduling examinations; coordinating VEs; reimbursement for expenses; accrediting VEs; question pools; Volunteer Examiners (VEs): definition; requirements; accreditation; reimbursement for expenses; VE conduct; preparing an examination; examination elements; definition of code and written elements; preparation responsibility; examination requirements; examination credit; examination procedure; examination administration; temporary operating authority

E1G Certification of external RF power amplifiers and external RF power amplifier kits; Line A; National Radio Quiet Zone; business communications; definition and operation of spread spectrum; auxiliary station operation

SUBELEMENT E2 -- OPERATING PROCEDURES [5 Exam Questions -- 5 Groups]

E2A Amateur Satellites: Orbital mechanics; Frequencies available for satellite operation; Satellite hardware; Satellite operations

E2B Television: fast scan television (FSTV) standards; slow scan television (SSTV) standards; facsimile (fax) communications

E2C Contest and DX operating; spread-spectrum transmissions; automatic HF forwarding; selecting your operating frequency

E2D Digital Operating: HF digital; packet clusters; HF digital bulletin boards; Automatic Position Reporting System (ARPS)

SUBELEMENT E3 -- RADIO WAVE PROPAGATION [3 Exam Questions -- 3 Groups]

E3A Earth-Moon-Earth (EME or moonbounce) communications meteor scatter

E3B Transequatorial; long path; gray line

E3C Auroral propagation; selective fading; radio-path horizon; take-off angle over flat or sloping terrain; earth effects on propagation

SUBELEMENT E4 -- AMATEUR RADIO PRACTICES [5 Exam Questions -- 5 Groups]

E4A Test equipment: spectrum analyzers (interpreting spectrum analyzer displays; transmitter output spectrum); logic probes (indications of high and low states in digital circuits; indications of pulse conditions in digital circuits); PC based testing procedures and performance limitations

E4B Frequency measurement devices (i.e., frequency counter, oscilloscope, dip meter); meter performance limitations; oscilloscope performance limitations; frequency counter performance limitations

E4C Receiver performance characteristics (i.e., phase noise, desensitization, capture effect, intercept point, noise floor, dynamic range {blocking and IMD}, image rejection, MDS, signal-to-noise-ratio); intermodulation and cross-modulation interference

E4D Noise suppression: vehicular system noise; electronic motor noise; static; line noise

E4E Component mounting techniques (i.e., surface, dead bug

{raised}, circuit board); direction finding: techniques and equipment; fox hunting

SUBELEMENT E5 -- ELECTRICAL PRINCIPLES [9 Exam Questions -- 9 Groups]

E5A Characteristics of resonant circuits: Series resonance (capacitor and inductor to resonate at a specific frequency); Parallel resonance (capacitor and inductor to resonate at a specific frequency); half-power bandwidth

E5B Exponential charge/discharge curves (time constants): definition; time constants in RL and RC circuits;

E5C Impedance diagrams: Basic principles of Smith charts; impedance of RLC networks at specified frequencies; PC based impedance analysis (including Smith Charts)

E5D Phase angle between voltage and current; impedances and phase angles of series and parallel circuits; algebraic operations using complex numbers: rectangular coordinates (real and imaginary parts); polar coordinates (magnitude and angle)

E5E Skin effect; electrostatic and electromagnetic fields

E5F Circuit Q; reactive power; power factor

E5G Effective radiated power; system gains and losses

E5H Replacement of voltage source and resistive voltage divider with equivalent voltage source and one resistor (Thevenin's Theorem).

E5I Photoconductive principles and effects

SUBELEMENT E6 -- CIRCUIT COMPONENTS [5 Exam Questions -- 5 Groups]

E6A Semiconductor material: Germanium, Silicon, P-type, N-type; Transistor types: NPN, PNP, junction, unijunction, power; field-effect transistors (FETs): enhancement mode; depletion mode; MOS; CMOS; N-channel; P-channel

E6B Diodes: Zener, tunnel, varactor, hot-carrier, junction, point contact, PIN and light emitting; operational amplifiers (inverting amplifiers, noninverting amplifiers, voltage gain, frequency response, FET amplifier circuits, single-stage amplifier applications); phase-locked loops

E6C TTL digital integrated circuits; CMOS digital integrated circuits; gates

E6D Vidicon and cathode-ray tube devices; charge-coupled devices (CCDs); liquid crystal displays (LCDs); toroids: permeability, core material, selecting, winding

E6E Quartz crystal (frequency determining properties as used in oscillators and filters); monolithic amplifiers (MMICs)

SUBELEMENT E7 -- PRACTICAL CIRCUITS [7 Exam Questions -- 7 Groups]

E7A Digital logic circuits: Flip flops; Astable and monostable multivibrators; Gates (AND, NAND, OR, NOR); Positive and negative logic

E7B Amplifier circuits: Class A, Class AB, Class B, Class C, amplifier operating efficiency (ie, DC input versus PEP), transmitter final amplifiers; amplifier circuits: tube, bipolar transistor, FET

E7C Impedance-matching networks: Pi, L, Pi-L; filter circuits: constant K, M-derived, band-stop, notch, crystal lattice, pi-section, T-section, L-section, Butterworth, Chebyshev, elliptical; filter applications (audio, IF, digital signal processing {DSP})

E7D Oscillators: types, applications, stability; voltage-regulator circuits: discrete, integrated and switched mode

E7E Modulators: reactance, phase, balanced; detectors; mixer stages; frequency synthesizers

E7F Digital frequency divider circuits; frequency marker generators; frequency counters

E7G Active audio filters: characteristics; basic circuit design; preselector applications

SUBELEMENT E8 -- SIGNALS AND EMISSIONS [4 Exam Questions -- 4 Groups]

E8A AC waveforms: sine wave, square wave, sawtooth wave; AC measurements: peak, peak-to-peak and root-mean-square (RMS) value, peak-envelope-power (PEP) relative to average

E8B FCC emission designators versus emission types; modulation symbols and transmission characteristics; modulation methods; modulation index; deviation ratio; pulse modulation: width; position

E8C Digital signals, including CW; digital signal information rate vs bandwidth; spread-spectrum communications

E8D Peak amplitude (positive and negative); peak-to-peak values: measurements; Electromagnetic radiation; wave polarization; signal-to- noise (S/N) ratio

SUBELEMENT E9 -- ANTENNAS AND FEED LINES [5 Exam Questions -- 5 Groups]

E9A Isotropic radiators: definition; used as a standard for comparison; radiation pattern; basic antenna parameters: radiation resistance and reactance (including wire dipole, folded dipole), gain, beamwidth, efficiency

E9B Free-space antenna patterns: E and H plane patterns (i.e., azimuth and elevation in free-space); gain as a function of pattern; antenna design (computer modeling of antennas)

E9C Phased vertical antennas; radiation patterns; beverage antennas; rhombic antennas: resonant; nonresonant; radiation pattern; antenna patterns: elevation above real ground, ground effects as related to polarization, take-off angles as a function of height above ground

E9D Space and satellite communications antennas: gain; beamwidth; tracking; losses in real antennas and matching: resistivity losses, losses in resonating elements (loading coils, matching networks, etc. {ie, mobile, trap}); SWR bandwidth; efficiency

E9E Matching antennas to feed lines; characteristics of open and shorted feed lines: 1/8 wavelength; 1/4 wavelength; 3/8 wavelength; ½ wavelength; 1/4 wavelength matching transformers; feed lines: coax versus open-wire; velocity factor; electrical length; transformation characteristics of line terminated in impedance not equal to characteristic impedance; use of antenna analyzers

Where did "73" come from? Actually it was part of the "Phillips Code" - a shorthand code developed by Walter P. Phillips in the 1870's to facilitate newspaper and court reporting transmitted over electric telegraph landlines.

Walter Polk Phillips began his career as a Morse telegrapher for the American Telegraph Company in Providence, RI.

The Associated Press came about in 1848 when, in an effort to reduce the high cost of telegraphed news, six competing New York City newspapers agreed to a joint effort to collect and distribute news over a common circuit.

At only age 18, Phillips was promoted to the position of Report Operator copying "press" dispatches from the AP. At one time, he held the speed record by copying 2,731 words in one hour (about 45 wpm) ... a feat that earned him a solid gold pen award from Prof. Samuel F. B. Morse.

Phillips was made manager of the AP's Washington Bureau in 1868 and persuaded them in 1875 to establish the nation's first leased wireline press service linking New York, Philadelphia, Baltimore and Washington.

Determined to make the AP the fastest news service in the country, he revised the existing abbreviations and codes used in the transmission of press. In 1879 he published the Phillips Code Book, 62 pages of (mostly) letter combinations and some numerals.

Its objective was not only speed, but to also cut down on telegraphy line time and message costs which were paid for by the word. For example, POTUS stood for "President of the United States" and SCOTUS: "Supreme Court of the United States."

In 1898, Walter Phillips was appointed vice president and general manager of the United Press. The Phillips Code remained in widespread use until teletype replaced telegraphy in the 1920's.

Today the AP network consists of more than 1,500 newspapers and 5,000 broadcast outlets in the United States. Worldwide, the AP serves more than 15,000 news organizations in 112 countries.

Very little of the Phillips Code is used today, but 30 "No more. End,", 73 "Best regards" and 88 "Love and Kisses" have endured.

FCC Amateur Radio Enforcement

James H. Davis W6IBD (Concord, CA) and **Kevin J. Britten KE6BAD (Ontario, CA)** have both been warned about their operation on local (W6CX and K6UQ) repeaters. The FCC said it expects them to comply with control operator requests that they not use these repeaters. The FCC said "Control operators may take whatever steps are appropriate to ensure compliance with the repeater rules...." Failure to abide by their request will jeopardize their licenses and could result in license revocation.

Joseph E. Giroux, Jr., KA1LWF (Dorchester, MA) has been warned by the FCC that "...you, or someone using your call sign, have operated radio-transmitting equipment in voice mode on 7.290 MHz and 3.880 MHz. These frequencies are not licensed to you under your Novice license." Continued "...such operation will not only lead to revocation of your license or a monetary forfeiture, but will also jeopardize any future attempts to obtain an upgraded Amateur Radio license."

Aaron H. Goldberg KBTUJ (Burnsville, MN) has submitted his Amateur Technician Class license to the FCC for cancellation. The FCC said "Should you apply for an Amateur license in the future, issues surrounding allegations of radio interference to the Burnsville, Minnesota Police Department may have to be resolved in order to determine your qualifications to hold an Amateur license."

Romeo A. Guango KHØLY (Saipan, MP) has been issued a warning notice and must respond to the FCC within 20 days to an allegation that on April 3 and 4, 2001, he engaged in deliberate interference which included playing music for more than half an hour on the MDX Amateur Club KHØMDX (145.280/144.680 MHz) repeater system. Continued such operation will lead to license revocation or a fine.

Jerry B. Heath NK4F (Jacksonville, NC) has been directed to respond within 20 days to eight complaints of deliberate interference, and other violations on 18.130 to 18.133 MHz beginning in March 2000.

Reyes Lugo KB9YDM (Chicago, IL) has had his General Class license granted for a one year short term renewal. His license had previously been held up due to complaints that raised questions about his qualifications to hold an Amateur license. "Those complaints concerned possible operation on 21.310 MHz in the Amateur Service and on 26.715 MHz, a frequency not authorized to you," the FCC said. He will be subject to a fine and his Amateur license will be designated for revocation if there are any violations during the one year period.

Joseph E. Mattern KG4NGG (Orlando, FL) has had his Amateur license set aside by the FCC's Wireless Telecommunications Bureau based on complaints received since the grant of his license on May 3, 2001. His application reverts to a pending status and the complaints have been referred to the Enforcement Bureau for evaluation. He has no authority to operate radio transmitting equipment.

David C. Mohre KA8OFE (Blakeslee, OH) was warned last March that his repeater system operating on 146.820 MHz in Williams County, Ohio was not identifying as required by the rules. He said that the repeater would be shut down within 48 hours and would not be activated until it could properly identify. The FCC said it has learned that the repeater continued operation for nearly a month without identification and was not shut down until May 14. The FCC said it "views misrepresentations and lack of candor very seriously" and will initiate revocation action against his license if this problem reoccurs.

The Westview Fairforest Fire Department (Spartanburg, SC) has been notified that their KNCN (154 MHz) radio system is interfering with Amateur radio repeater WR4WG operating on 144.650/145.250 MHz. The FCC said they have information that the fire department had previously been contacted about this problem but that it has not been solved. They were asked to contact the licensee of the Amateur repeater to determine what steps can be taken to resolve this matter. The Fire Department also is to advise the FCC within 30 days what action has been taken to solve this interference problem. "If, after review of the problem, it is the position of your service personnel that the problem is not caused by your system, state in detail the technical findings upon which that conclusion was based and include a copy of the report."

VANITY CALL SIGNS: Frequently Asked Questions

The following will answer 99 percent of your questions about eligibility for any type of a "Vanity" callsign.

Q. What is a "Vanity" station call sign?

A. A "vanity" call sign is like a "vanity" automobile license plate. It is an Amateur call sign that, subject to availability, is personalized to the radioamateur's wishes. You must meet certain license class criteria in selecting your call sign and list the exact prefix, numeral and suffix for each selected call sign in order of preference. The FCC assigns the first assignable call sign from your list. Unlike sequentially issued call signs, a Vanity call sign is not free.

Q. Who is eligible to select a Vanity station call sign?

A. Any individual Amateur or Club station which has already been issued a call sign may obtain a call sign of choice subject to certain restrictions. RACES and military recreation stations are not eligible for a vanity call sign. A Vanity call sign can only be obtained in exchange for an existing call. Licensees cannot get a Vanity call sign as their first call sign. Individual and club Vanity call signs may only contain a format equal to or lower than that of the Amateur or Club trustee making the request. (There are a few exceptions.)

Q. What are call sign "Groups" and how does it impact the Vanity Call Sign System?

A. Effective March 24, 1978 the FCC began issuing all Amateur Radio station call signs "systematically" - that is, in strict alphabetical order within four format blocks called Group A, B, C and D. The shorter (and theoretically more desirable) call signs were allocated to Group A ...the longest (2-by-3 format) call signs were allocated to Group D.

Table No. 1 indicates the call sign groupings for the various license classes for radioamateurs with continental (48 contiguous states) mailing addresses. You may choose any radio district numeral (zero trough 9) under the Vanity callsign system.

Table No. 2 indicates the call signs that are available to radioamateurs with mailing addresses outside of the 48 continental United States. You need not reside in these areas to qualify for these special prefixes.

Table No. 1

FOR STATIONS WITH MAILING ADDRESSES LOCATED IN THE 48 CONTIGUOUS (MAINLAND) UNITED STATES	
Call Sign Group & License Class	**Station Call Sign Format Qualified For:**
Group A: Extra Class	1-by-2 call signs beginning with the prefix letter K, N or W; 2-by-1 call signs beginning with the prefix letters AA to AK, KA to KZ, NA to NZ and WA to WZ ...and 2-by-2 call signs beginning with the prefix letters AA to AK.*
Group B: Advanced Class	2-by-2 call signs beginning with the prefix letters KA to KZ, NA to NZ and WA to WZ.*
Group C: Technician, Tech Plus & General Class	1-by-3 call sign formats beginning with K, N or W. (K and W prefixed call signs are not assigned as an initial - i.e. non-vanity - call sign.)
Group D: Novice Class	2-by-3 call sign formats beginning with KA to KZ and WA to WZ. (AA-AL-by-3 and NA-NZ-by-3 formats are not available for assignment.)*
* Certain two letter prefixes are not available to mainland U.S. radioamateurs. (See Table No 2.)	

Table No. 2

FOR STATIONS WITH MAILING ADDRESSES OUTSIDE OF THE 48 CONTIGUOUS (MAINLAND) UNITED STATES				
Certain 2-letter prefixes are reserved for Amateurs with mailing addresses outside of the 48 contiguous states. These 2-letter prefixes may NOT be selected under the Vanity Call Sign System by radioamateurs with mailing addresses in the 48 (mainland) U.S. states.				
2-Letter Prefixes Reserved for:	**Extra Class (Group A)**	**Advanced Class (Group B)**	**Technician, Tech Plus & General (Group C)**	**Novice Class (Group D)**
AH, KH, NH and WH Pacific Area. [1] *	AH, KH, NH, WH-by-1 letter suffix;	AH-by-2 letter suffix;	KH, NH, WH-by-2 letter suffix	KH, WH-by-3 letter suffix. (AH, NH-by-3 not assigned.)
AL, KL, NL and WL Alaska (only)	AL, KL, NL, WL-by-1 letter suffix;	AL-by-2 letter suffix;	KL, NL, WL-by-2 letter suffix	KL WL-by - 3 letter suffix. (AL, NL-by-3 not assigned.)
KP, NP and WP Atlantic Area. [2] *	KP, NP, WP-by-1 letter suffix	KP-by-2 letter suffix;	NP, WP-by-2 letter suffix	KP, WP-by-3 letter suffix. (NP-by-3 not assigned.)
1 Includes: Hawaii, Guam and American Samoa. 2 Includes: U.S. Virgin Islands and Puerto Rico. * And certain other small U.S. island possessions				

As a general rule (and there are exceptions) under the Vanity Call Sign System, Amateur Extra Class radio operators qualify for Group A, B, C or D station call sign formats. Advanced Class operators qualify for Group B, C or D formats. Technician, Tech Plus and General Class operators qualify for Group C or D. Novice operators qualify only for a Group D call sign.

Q. What call signs are not available to the Vanity Call Sign System?

A. A few seemingly available call signs are not available for assignment. They are:

1.) KA2AA through KA9ZZ, KC4AAA–KC4AAF, KC4USA–KC4USZ, KG4AA–KG4ZZ, KC6AA–KC6ZZ, KL9KAA–KL9KHZ, and KX6AA–KX6ZZ;

2.) To eliminate confusion, any call sign having the letters SOS or QRA through QUZ as the suffix;

3.) Any call sign having the letters AM-AZ as the prefix. These prefixes are assigned to other countries by the ITU.;

4.) Any 2-by-3 format call sign having the letter X as the first letter of the suffix. These are assigned to experimental (non-Amateur) stations;

5.) Any 2-by-3 format call sign having the letters AF, KF, NF, or WF as the prefix and the letters EMA as the suffix. These have been allocated to (U.S Government) Federal Emergency Management Agency (FEMA) stations for emergency use;

6.) Any 2-by-3 format call sign having the letters AA-AL or NA-NZ as the prefix;

7.) Any 2-by-1, 2-by-2 or 2-by-3 format call sign having the letters AH, AL, KH, KL, KP, NH, NL, NP, WH, WL or WP as the prefix unless your mailing address is outside of the 48 contiguous U.S. states. These prefixes are available ONLY to radioamateurs with non-contiguous U.S. mailing addresses in the state of Alaska and Hawaii and certain U.S. possessions. (Such as Guam, American Samoa, U.S. Virgin Islands, Puerto Rico and other small island possessions.)

8.) Any 1-by-1 format call sign. These are reserved by the Special Event Call Sign System. (For example: K1A.) Note: 1x1 call signs with a "X" suffix letter are not assignable.

9.) Station call signs that have been inactive for less than two years. As a general rule (there are exceptions) a call sign may not be reassigned under the Vanity call sign system unless it has been inactive for a minimum of two years following expiration, revocation, relinquishment or death of the applicant.

Q. May I renew or change my name or address at the same time I apply for a Vanity call sign?

A. No! You must hold an unexpired amateur operator/station license of the proper operator class, as described above, to request a Vanity call sign for station. To request a Vanity call sign for a club station, you must hold an unexpired club station license showing you as the license trustee. Your name and mailing address as shown on your current licensing information in the FCC database must be correct. If your license has expired, or if your name or address has changed, you must first modify your station license so that it shows the correct information in the FCC database before you apply for a Vanity call sign.

Q. How do I determine what Vanity call signs are available to me? What can I choose from?

A. This is by far the most common question. There are nearly 15 million possible call sign combinations in the Amateur Radio Service and there are strict eligibility and availability rules. As a general rule:

1.) You (as an individual radioamateur or club trustee) must be eligible for a specific group call sign. An Extra Class licensee is eligible for any available call sign (Group A, B, C or D.) Advanced Class licensee may select any available Group B, C or D call sign. General, Tech Plus and Technician may select Group C or D. Novices are only eligible for Group D Vanity call signs. (See call sign groups in Table No. 1 and 2.)

2.) Vanity call sign assignment is not limited to your call sign district. You or your club trustee can apply for a call sign with any radio district numeral, 0 (zero) through 9.

3.) Refer to the FCC's Amateur Service licensee database to verify that the call sign you are requesting is not already assigned. This database is available at various sites on the World Wide Web including: (ARRL) <http://www.arrl.org/fcc/fcclook.php3>, (Buckmaster) <http://www.buck.com/cgi-bin/do_hamcall>, (QRZ) <http://www.qrz.com> and (WM7D) <http://www.wm7d.net/fcc_uls/ulsquery.html>.

You can also query the FCC's ULS (Universal Licensing System) database on the web by accessing the application or license search utilities. These can be accessed at <http://www.fcc.gov/wtb/uls>. Click on the button labeled 'Application Search' or 'License Search' and use the 'General Search' option. (Amateur Radio Information can be accessed by searching on radio service codes 'HA' - sequentially assigned call signs and 'HV' - vanity call signs. Both can be selected during the same search.)

4.) Even where a call sign does not appear on the database, it may not be available for assignment. Remember, some call signs are not assignable to anyone for various reasons. (See above.)

5.) A call sign is normally assignable two years following license expiration or death of the licensee. The Amateur Service database contains licensees with expired licenses, that is, in the "2-year" grace period. Therefore, any call sign that is still in the FCC database of radioamateurs is not assignable as a Vanity call sign.

6.) Even though the licensee may be deceased for more than two years, be certain that the call sign of the deceased is still not shown in the Amateur Service database. You must send a copy of the death certificate (or a obituary notice from a newspaper) to the FCC and request cancellation of the call sign from the FCC records prior to filing the application for a Vanity call sign.. Send to: FCC Amateur Section, 1270 Fairfield Road, Gettysburg, PA 17325-7245. A call sign can not be held for you during the cancellation and application process.

7.) A very good Vanity call sign search resource is Michael Carroll's (N4MC) *Vanity Call Sign Headquarters* located at: <http://www.carroll-usa.com/vanity>. This website lists immediately available and soon to be available call signs. The site also lists Vanity call signs that have been selected by and in the process of being issued to others. N4MC, a computer professional, has done an absolutely magnificent job of programming a "robot" to automatically check various FCC transaction files and update Vanity call sign information every ten minutes! The site even has a "prediction" feature that tells you what callsign you will probably get which has been 98 percent accurate in the past.

8.) Finally, be aware that thousands of Vanity call signs are issued every year and someone else may also be requesting the same call sign you want. Preferential call signs, such as those with a 1-by-2 format, are particularly popular. All Vanity call signs go to the radioamateur who requests it first. Vanity applications filed online are handled first by the FCC before those filed in

paper form.

Q. How do I get my old call sign back?

A. You may request a currently unassigned call sign under the Vanity Call Sign System that was previously assigned to you as your primary, secondary, repeater, auxiliary link, control or space station. You do not have to wait two years after expiration to request your former call sign. A call sign request by a former holder may be from any Group. That is, you do not have to hold a specific class of operator license. Although the FCC does not require submitted proof that you previously held a specific call sign, you should be prepared to show evidence if you are asked for it. A call sign requested by a former holder may be from any call sign region.

Q. May I obtain the call sign of a deceased relative?

A. When the holder dies, a call sign is immediately assignable to a "close relative" once it is no longer in the database. You do not have to wait two years before you apply for the call sign. The FCC defines a close relative of a deceased amateur as a spouse, child, grandchild, stepchild, parent, grandparent, stepparent, brother, sister, stepbrother, stepsister, aunt, uncle, niece, nephew, or in-law. You must indicate your relationship to the deceased person on the Vanity call sign application.

But there is an important catch! You must hold a call sign in a "Group" equal to or higher than the deceased. That is, you must be an Amateur Extra Class operator if the deceased held a Group A call sign. (It follows that you must be an Amateur Extra or Advanced Class operator to request a Group B (2-by-2 format) call sign. You must be an Amateur Extra, Advanced, General, Technician Plus, or Technician Class operator if the deceased relative held a Group C (1-by-3 format) call sign . A licensee of any license class may request a Group D (2-by-3 format) call sign.

If the deceased Amateur's call sign is still listed in the licensee database, it must be removed prior to Vanity call sign application. This is accomplished by submitting a signed letter requesting license cancellation accompanied by a copy of the death certificate or an obituary from a newspaper that shows the date of death.

Send to: FCC Amateur Section, 1270 Fairfield Road, Gettysburg, PA 17325-7245 prior to filing the application for a vanity call sign. Be aware that someone could request and obtain this call sign before you do. Call signs cannot be held by the FCC for assignment to anyone.

Q. How can our club obtain a Vanity call sign for our club station?

A. There are three ways; by (1) requesting a Vanity call sign by listing assignable call signs in order of preference, (2) by reclaiming a previously held club call sign or (3.) "in memoriam." While an individual Amateur Radio operator may hold only one primary Amateur Radio station license and Vanity station call sign, there is no limit to the number of club station licenses or Vanity call signs that can be held by the same club.

The trustee's operator class determines the "Group" of the call sign. For example, you must be an Amateur Extra Class operator to apply for a Group A call sign. (After you have obtained a Group A vanity call sign for your club station, you may replace the Extra Class trustee with a person who holds another class of operator license without losing your Group A Vanity call sign.)

The club call sign you select must have been unassigned for at least two years if you are simply requesting a Vanity call sign for your club. The two year rule does not apply if you are reclaiming a previously held call sign for which the requestor was the license trustee or are applying for the "memorial" call sign of a previous club member, now deceased. A call sign request by former holder may be from any Group.

Q. How does our club apply for the call sign of a deceased club member?

A. The trustee of a club station may request the call sign as a tribute to a former member even when it has been less than two years following the club member's death. The trustee must hold a call sign in a "Group" equal to or higher than the deceased.

The call sign is immediately assignable after the death of a club member providing a written statement from a close relative of the deceased showing consent to the call sign assignment is in the club station records. The statement of consent must state the sender's relationship to the deceased and confirm the deceased person's association with the club. Do not send the supporting documentation to FCC unless requested to do so.

A close relative of the deceased is defined as the member's spouse, child, grandchild, stepchild, parent, grandparent, stepparent, brother, sister, stepbrother, stepsister, aunt, uncle, niece, nephew, or in-law.

We can get you a Vanity Call Sign

Through our Vanity call sign assistance program, we here at the W5YI Group have helped thousands of radio-amateurs obtain a different Amateur Radio station call sign. (You can even apply for a Vanity call sign online at our website at <www.w5yi.org.>. Click on the "Vanity Call Signs" box No paperwork or FCC filing is required at all.)

Although you can do it yourself, it is a very complicated procedure. It involves registering in the FCC's ULS (Universal Licensing System) and then going online (or filing a paper FCC Form 605) with the FCC. You also need to file a Form 159 Remittance advice. It costs $14.00 if you handle everything yourself. The FCC instructions are located on the Web at: <www.fcc.gov/wtb/-amateur/VanityCS.html>. The ARRL also has an online writeup at: <www.arrl.org/arrlvec/vanity.html>

The W5YI Group charges $29.95 (which includes the FCC's $14.00 regulatory fee) if you want us to handle everything for you. It can be paid by credit card. To have us file your Vanity Call Sign application, we need your ULS password. If you registered yourself in ULS, you already have this password. More likely, you were automatically registered by the VEC who handled you new, upgraded or renewed license. In that case, you will need to call the FCC's ULS support line (at 202-414-1250) and ask for a temporary password so you can access your record. It takes about 30 days to obtain a Vanity call sign.